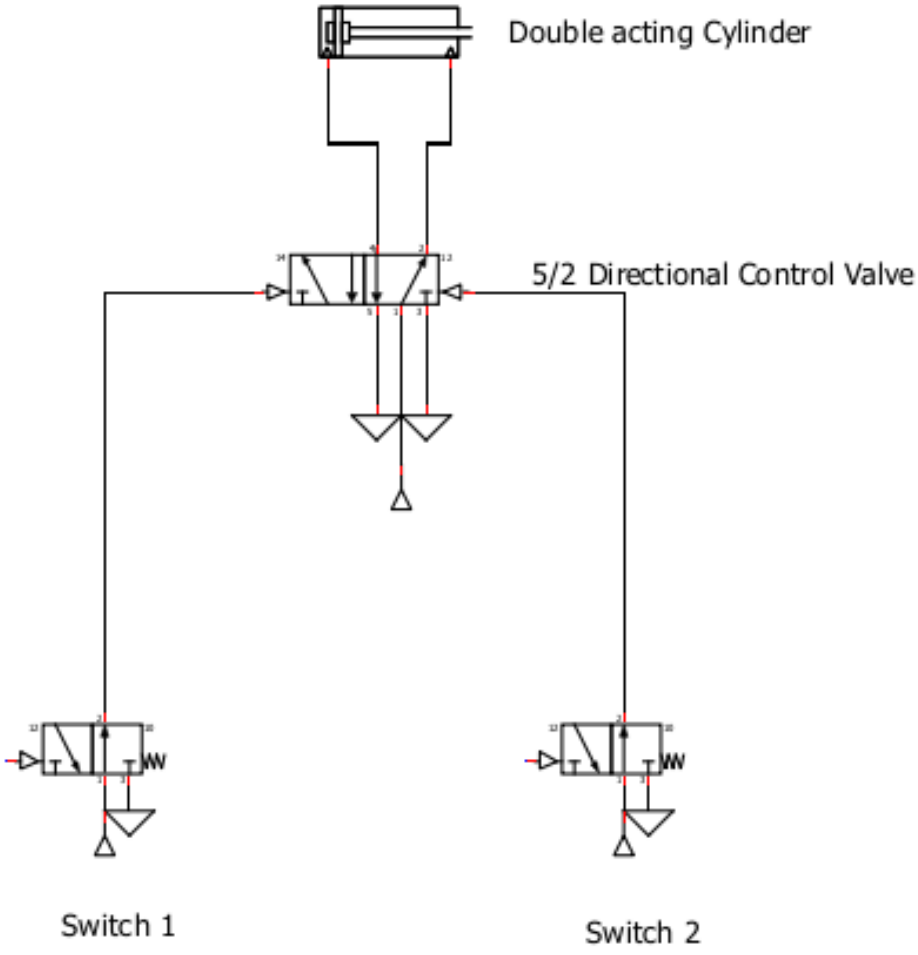
Pneumatic Assignment

Assignment-7:

By using a diverting device, articles are to be moved from one conveyor to anotherconveyor. Diverting device is pushed forward once the articles are in position by sensors. After the diverting device has reached the forward end position, it is automatically returned to its start position.

Problem description:

There are two conveyor belt and when an article reaches certain point it has to move to another conveyor belt. There is a sensor for sensing if the article is in right place. There is a diverting device to move article from one conveyor belt to another . When the limit switch senses the article it sends signal to the diverting device and limit switch of the diverting device is triggered. After pushing the article one conveyor to another, when it reaches its end position, it sends signal to return the diverting device to its original position until next article comes again.



Solution:

Here we have used two limit switches for controlling the system . Switch-1 is used to on the system and switch-2 to off the system. Both Switch 1 and Switch 2 has 3 ports; port 1 is connected to air supply, port 3 is connected to exhaust for exit the existing air in the switch and port 2 is the output of the switch which is connected to a 5/2 pilot operated pneumatic control valve. This 5/2 pilot operated pneumatic valve has 5 ports where port1 is connected to air supply, port 3,5 is connected to exhaust and the port 2,4 acts as the output of 5/2 pilot operated pneumatic control valve and is given to double acting cylinder. The double acting cylinder has two ports . The output of port 2 of directional valve goes to port 1 of double acting cylinder to push the piston forward. The output of ort 4 of directional valve goes to port 2 of the cylinder pushing the piston backward at its original position.

Operation:

When the limit switch senses the article, the 'Switch-1' limit switch is triggered . When Switch-1 is on, the air supply is sent to switch through port-1 . Then the output of switch goes to 5/2 pilot operated pneumatic control valve. Then the air from 5/2 pilot operated pneumatic control valve goes through port 2 to the double acting cylinder . The air enters the cylinder and pushes the piston forward. Then the piston pushes forward the article. Once it has reached highest point , the switch-2 is triggered and similarly its output goes to 5/2 pilot operated pneumatic control valve and the output air of 5/2 pilot operated control valve goes through port-4 to the double acting cylinder pushing the piston backward to its original position.

Sequence testing:

When limit switch senses the article ,the switch-1 is on and the piston of the cylinder moves forward and pushes the article . When the piston is at it's end position limit switch 'switch-2' is triggered and the piston of the cylinder moves backward at its original position.

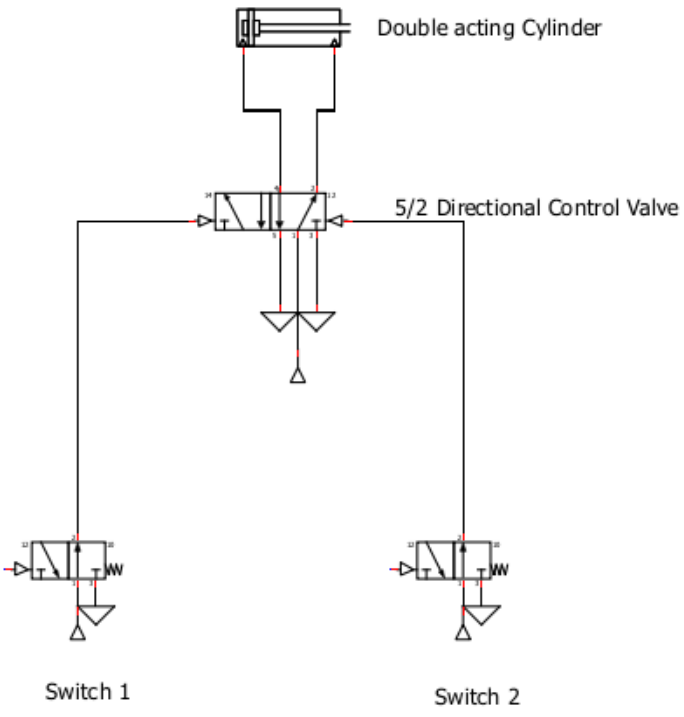
Written by- Supratit Das

Assignment -8 :-

Parts are to be punched using a double acting via a mechanical linkage. Punching is only possible when the work piece is in position (mandrel), the safety cover closedand either a push button or a foot pedal is actuated. After the punching cylinder has reached the rear end position, it is automatically returned to its extended positions.

Problem description:

There is a punching machine which punches the work pieces. When the work piece is in position to punch the limit switch is on and signal is sent to punch . After punching when the cylinder reaches its rear end position a signal is sent to return the cylinder at its original position.



Solution:

Here we have used two push limit switch for controlling the system . Switch-1 is used to on the system and switch-2 to off the system. Both Switch 1 and Switch 2 has 3 ports; port 1 is connected to air supply, port 3 is connected to exhaust for exit the existing air in the switch and port 2 is the output of the switch which is connected to a 5/2 pilot operated pneumatic control valve. This 5/2 pilot operated pneumatic control valve has 5 ports where port1 is connected to air supply, port 3,5 is connected to exhaust and the port 2,4 acts as the output of 5/2 pilot operated pneumatic control valve and is given to double acting cylinder. The double acting cylinder has two ports . The output of port 2 of directional valve goes to port 1 of double acting cylinder to push the piston forward. The output of ort 4 of directional valve goes to port 2 of the cylinder pushing the piston backward at its original position.

Operation:

When limit switch senses the mandrel, 'Switch-1' limit switch is on . When Switch-1 is on, the air supply is sent to switch through port-1 . Then the output of switch goes to 5/2 pilot operated pneumatic control valve. Then the air from 5/2pilot operated pneumatic control valve goes through port 2 to the double acting cylinder . The air enters the cylinder and pushes the piston forward. Then the piston punches the mandrel. After punching once it has reached highest point , the switch-2 is triggered and similarly its output goes to 5/2 pilot operated pneumatic valve and the output air of 5/2 pilot operated pneumatic valve goes through port-4 to the double acting cylinder pushing the piston backward to its original position.

Sequence testing:

When limit switch 'switch-1' is on and the piston of the cylinder moves forward and punches the mandrel . When the piston is at its end position the signal goes to limit switch 'switch-2' and the piston of the cylinder moves backward at its original position.

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